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Tourist Ports and Yachting: The Case of Sardinia

Puertos Turísticos y Navegación de Recreo: El Caso de Cerdeña

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Abstract
The aim of this work is to describe the situation of nautical tourism in one of the largest islands in the Mediterranean through the analysis of the marinas and the sailing habits of the boaters. After outlining the typology, characteristics and functions of the marinas in the introduction, we briefly present the quantitative-qualitative analysis methodology that was carried out through interviews to the stakeholders and subsequent processing of the original information obtained. The presentation of the results concerns the context of Italian ports and then focuses on Sardinia in terms of ports and berths. The discussion, on the other hand, is based on the original analysis of the use of Sardinian ports, the navigation mode of the boaters, including the characteristics of the boats used. In the conclusions, it is emphasized that Sardinia is at the centre of a boating area that extends to the Upper Tyrrhenian Sea, within which it represents a hub and the favourite area for the most important and rich segment of yachts. This, however, does not preclude existing structures from pursuing an improvement in the supply from the point of view of environmental compatibility, of the quality of the services offered and, above all, of a stronger connection to the tourist offer of the hinterlands.

1 The general outline of this work and paragraph 2 are the result of collaboration between the authors. Paragraphs 1 and 4 are by Gian Marco Ugolini; paragraphs 3 and 5 are by Enrico Ivaldi.

Revista de Estudios Andaluces, vol. 34, núm. 1 (2017) pp.429-452. e-ISSN: 2340-2776
http://dx.doi.org/10.12795/rea.2017.i34.15

A possible development of the present study may cover other similar cases in the Mediterranean, regarding in particular the specific aspect of the degree of openness towards the boaters coming from "continental" territories.

Keywords: Nautical tourism, tourist ports, survey, data-analysis, Sardinia-Italy.

Resumen

El objetivo de este trabajo es analizar la situación del turismo náutico en una de las islas más grandes del Mediterráneo mediante la caracterización de la fortaleza de sus puertos turísticos y de los hábitos de navegación de los deportistas. Tras el marco general de la introducción, se explica la tipología, características y funciones de los puertos deportivos; así como la metodología seguida para el análisis cualitativo y cuantitativo de la información primaria obtenida a través de un proceso de encuestación a los agentes clave. Los resultados muestran la situación y estado actual de los puertos italianos y permiten conocer en detalle el caso de Cerdeña en relación a sus puertos y atraques. La discusión de los resultados, sin embargo, gira en torno al análisis de los rasgos de los usuarios de los puertos sardos y a la modalidad de navegación de los deportistas, incluyendo las características de los barcos utilizados. Las conclusiones subrayan que Cerdeña se encuentra en el centro de una amplia área de navegación como es el Alto Tirreno, donde desempeña un papel fundamental al ser la zona preferida del segmento de mayor poder adquisitivo que atraca con naves de recreo. Este hecho no excluye que las estructuras existentes en la isla deban perseguir una mejora de la oferta en términos de sostenibilidad ambiental, calidad de los servicios, y sobre todo, en establecer mejores vínculos con la oferta turística disponible en el interior. Un desarrollo del presente estudio puede aplicarse a casos similares de la cuenca mediterránea y, en particular, en lo relativo al estudio del grado de apertura a deportistas provenientes de sus respectivos espacios “continentales”.

Palabras clave: Turismo náutico, puertos turísticos, encuesta, análisis estadístico, Cerdeña-Italia.

1. INTRODUCTION

The topic of nautical tourism, and of tourist ports in particular, is not a new one, but it has acquired increasing attention from scholars over time in relation to different aspects. The first one concerns definitional problems and the limits in identifying the sector itself (Luck, M., 2007). As part of this trend we can mention for example the debate about the structure of the sector, often identified as a complex supply chain or a value chain. Within this chain, as discussed below, there are elements that do not always have the same purpose, which is one of the causes of conflicts and mediation spaces.

Certainly, environmental issues have always been among the most debated, both in terms of protection of the coast, endangered by the construction of marinas, and from the point of view of port management, since ports act as real concentrators of motor boats, with their polluting potential during parking and navigation (Ugolini, G. M., 2013a; Garrod, B., 2008; Miller, M. L., 1993). In this regard, islands are particularly fragile: traditionally their coasts are the primary communication interface with the "outside world" and at the same time they are often an important resource in terms of exploitation of the sea and its tourism component.

Therefore, legitimate concerns about environmental protection contrast in some way with the emphasis on the economic aspects of nautical tourism: coastal areas are increasingly perceived as sources of wealth in terms of employment in all direct and indirect activities, thanks to the inflow of boaters and their related spending in ports, cities and the port hinterland (Ivaldi, E., 2013; 2016a).

The issue of the sustainability of tourist ports is not addressed here: for this reason, while no analysis of the situation in the individual ports has been carried out – for it would require more extensive work - it is clear that any new intervention of port policy and, more importantly, any new infrastructure, must follow the well-known sustainability criteria specifically aimed at safeguarding the integrity of coasts and water quality, with particular attention to the water within port docks.

From this point of view, marinas constitute a necessary condition for the creation and development of nautical tourism, which actually sits alongside several other leisure and sport activities related to the sea. However, unlike other activities, nautical tourism appears to some extent "disorganized" and left to the boat owner's initiative as to its practice and modes of enjoyment (ISPO, 2009). A further development of this sector may be sought precisely in a form of standardization and packaging of nautical tourism products. The practice of the charter and of yacht rental clearly aims to such a goal and can open up new markets.

Revista de Estudios Andaluces, vol. 34, núm. 1 (2017) pp.429-452. e-ISSN: 2340-2776
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However, at the present time, in addition to the marked presence of the marina, the boat owner is the undisputed protagonist. In order to understand nautical tourism it is necessary to investigate and outline the boater's behaviour, preferences, habits at sea and on land. In most cases, the need emerges of empirical investigations on the field, that must be interpreted within the specific context (Jovanovic, T. et al, 2013). This is the case of nautical tourism in the islands, which has both the general characteristics of the segment and the particularities linked to the geographical location of the island considered.

There are different analyses of this kind both in the Mediterranean area and in the international arena, all linked to the geographical specificity mentioned above: large or small islands; coastal islands and islands far from the reference coasts; islands that bridge to more complex itineraries or islands that are the only destination of navigation (Alcover, A. et al, 2011; Adriatic Report, 2006; Diakomihalis, M.N. and Lagos, D.G., 2008; Mendola, D. and Ruggieri, G., 2004).

It is essential to identify the specificity of boaters in order to improve the reception in the ports (and in the territory) and to offer the services they expect (Ugolini, G. M., 2015).

Nautical tourism presents a somewhat complex articulation which can be made explicit using an interpretive scheme borrowed from economic sectors that are based on the mechanism of reconciliation between supply and demand and on the related "products" available on the market -the various types of nautical tourism- (Federazione del Mare-CENSIS, 2015; AMI-CENSIS, 2008).

Such a scheme[2] shows a logical-temporal chain that pivots on a series of intersections through which nautical tourism as a product is created. On the supply side it all starts from the boat, owned or otherwise available to boaters, its launch (and of course its parking and maintenance), to finally arrive to navigation. The demand is represented by those who intend to do nautical tourism; the match between supply and demand takes place right in the market with the practice of the different types of navigation-related tourism: boating at sea, sailing in inland waters, water sports, etc. (Benevolo, C., 2010; Penco, L., 2008a; Italian Ship & Yacht Brokers Association, 2017).

To further articulate this interpretive framework, it can be noted that within each intersection the relative economic effects manifest themselves through a direct production of wealth, in addition of course to all the phenomena of derived profits. Finally, if the aim is to know the mechanisms of development of the sector, we should not leave out those aspects that can be defined as cross-disciplinary, since they contribute, to different but often significant extent, to the growth of nautical tourism. In this analysis we will examine only two intersections and in particular the one

[2] For a complete description of the scheme see Gian Marco Ugolini (2010).

Revista de Estudios Andaluces, vol. 34, núm. 1 (2017) pp. 429-452. e-ISSN: 2340-2776
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concerning the supply, constituted by the presence of marinas, and the one regarding the demand, constituted by boaters (Quagli, A., 2008; Osservatorio Nautico Nazionale, 2008-2013-2014; Penco, L., 2008). The specificity of the islands, and in our case of Sardinia, concerns precisely the boaters, because they come not only and not mainly from the island itself, but from the outside continental territories.

The ports are a highly strategic intersection in the chain and represent the land-water interface. They are structured in different ways, starting from the more structured marinas to the most essential functions provided by simple slides to the sea. Moreover, the ports are not all functionally identical and have three main features: there is the "garage-port" mostly used all year as a base by the so-called stationary boaters coming from a neighbouring area (maximum 2-3 hour trip) and owners of a unit up to 10 meters or also of a medium-small one. Users in this category of ports can be further segmented into those who reside on site, generally with boats smaller than 10 meters, and those who come in the summer or for the holidays, and combine yachting to beach tourism.

The "square on the sea" ports have several functions and a high value for tourism, and are available to both boaters and residents. The presence of a multitude of shops and restaurants, the ability to host exhibitions and events make them a real place of sociability (like a square) and an attractor, in addition to other such places already present in the city.

A third type of port is that of the marinas, or "nautical villages": a boater-oriented port with a variety of services aimed at the boat and the person. The marinas are often placed in an environmentally prestigious setting, even separated from the city centre. Often they offer significant hospitality both in terms of hotel facilities and residential buildings constructed for the purpose of completing the supply to buyers of individual berths. Obviously, within this classification we can find "mixed solutions" as well as very specialized ones, related for example to the presence of shipyards for yachting units.

2. OBJECTIVES AND METHODOLOGY

The aim of this study is to analyse the present situation of one of the largest islands in the Mediterranean in relation to the offer of marinas and what is its degree of openness to the inflow from other "continental territories". It is obvious that the theme and the results presented here are not limited to this case but may offer a model of analysis for other similar cases in the Mediterranean: that is, all those islands with large surface area and human settlements, a few tenths or hundreds of miles offshore, that have decided to focus on nautical tourism, not limited to residents.

Revista de Estudios Andaluces, vol. 34, núm. 1 (2017) pp.429-452. e-ISSN: 2340-2776
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In the first phase the methodology of this analysis, is fundamentally aimed at describing the phenomenon. The structure of port supply is analysed through a detailed processing of existing databases. The characteristics of the yachting activity in Sardinia, instead, are analysed in 2014 through an original research carried out by the authors as part of their scientific direction of the National Nautical Observatory and of their statistical data analyses, through a proprietary database query related to a panel of 1,204 Italian and foreigners boaters.

This survey consisted first of all in the creation of a structured questionnaire for the two categories of stakeholders analysed: firstly, the boaters who have their boat in the ports of Sardinia or who passed through them. Secondly, the port authorities of all the ports in the island were consulted, obtaining a response from more than 50% of them. The boaters were mainly asked about the modalities and motivations linked to their choice of using Sardinian ports. Authorities were asked about the number of berths and the modes of use by the boaters, crossing the data emerged with those indicated by the boat owners. This, among other things, allowed for the first time to have a complete picture of the flows through a matrix that relates the origin / residence of boaters and the region of the home port.

3. RESULTS

At the national level there are 554 port structures: slightly more than two thirds are represented by poly-functional ports, 22% are simple moorings and 14% are marinas (Table 1). In this regard, ports are conventionally divided into three different types: marinas (basically, private tourist ports), poly-functional ports (generally, public facilities), and moorings (with temporary structures at best). They provide different levels of service, oriented both to the boat (mooring, electricity, water, fuel, repairs, etc.) and to the person (catering, business services, sports activities, etc.).

The situation of berths is partly different: as can be seen in Table 1, it differs from the distribution of port structures. While the poly-functional ports remain in the first place, offering 62% of the total of Italian berths (with an average of 280 berth per port), the marinas rise up and include more than 26% of the berths (with an average capacity of 548 berths per port); moorings constitute a residual portion, with 11% of the berths (an average of 150 berths per port)[3]. All this, without delving into the topic here, has significant implications in terms of concentration phenomena of impacts, be they environmental, logistic and of accessibility, economic, social and related to urban planning (Jugović, A., Kovačić, M., Hadžić, A., 2011).

As for the overall presence of port facilities, Sardinia is placed in a position of excellence (in second place, after Sicily) with 80 ports. In terms of berths it also ranks

[3]Having proceeded with sample checks, it can be asserted that to date (2017) the situation is substantially unchanged.

Revista de Estudios Andaluces, vol. 34, núm. 1 (2017) pp. 429-452. e-ISSN: 2340-2776
http://dx.doi.org/10.12795/rea.2017.i34.15

second (with nearly 20,000, after Liguria). In general, the basin of Upper Tyrrhenian[4] is particularly strong in the provision of facilities, also from the qualitative point of view: 30 marinas out of a national total of 78, with Sardinia offering 12.

Table 1. Ports and berths by macro-area.

Regions/Macro Regions	PORTS				BERTHS			
	N° infrastr.	Marinas	Poly-functional ports	Moorings	N° infrastr.	Marinas	Poly-functional ports	Moorings
Liguria	56	12	38	6	22,994	6,963	15,674	357
Tuscany	43	6	31	6	18,645	3,647	13,562	1,436
Sardinia	80	12	41	27	19,872	5,250	11,411	3,211
Upper Tyrrhenian	*179*	*30*	*110*	*39*	*61,511*	*15,860*	*40,647*	*5,004*
Lazio	30	3	27	0	8,681	2,978	5,703	
Campania	51	5	34	12	13,055	2,893	8,831	1,331
Central Tyrrhenian	*81*	*8*	*61*	*12*	*21,736*	*5,871*	*14,534*	*1,331*
Basilicata	3	2	1	0	1,900	1,300	600	
Calabria	17	1	9	7	4,779	205	3,427	1,147
Sicily	89	4	47	38	18,099	2,710	10,543	4,846
Puglia	48	3	38	7	10,823	1648	8,147	1,028
Molise	3	1	2	0	710	420	290	
Abruzzo	8	1	7	0	2,534	1,250	1,284	
South	*168*	*12*	*104*	*52*	*38,845*	*7,533*	*24,291*	*7,021*
Marche	12	3	9	0	6,027	2,210	3,817	
Emilia Romagna	24	8	14	2	6,056	3,512	1,796	748
Veneto	48	7	33	8	12,562	3,031	6,811	2,720
Friuli V.G.	42	10	23	9	13,831	4,801	7,533	1,497
Upper Adriatico	*126*	*28*	*79*	*19*	*38,476*	*13,554*	*19,957*	*4,965*
Total Italy	**554**	**78**	**354**	**122**	**160,568**	**42,818**	**99,429**	**18,321**

Source: Our elaboration from Osservatorio Nautico Nazionale (2013).

When considering Sardinia as a whole, and reasoning about average values, the deep differences between individual regions within it cannot be fully appreciated. Precisely in this regard, it was considered useful to propose a geographical breakdown based on the density of the presence of port facilities and berths.

The distribution of ports is intimately linked to the diversity of coasts in the four provincial groupings: these specificities manifest alternately in the attractiveness of the irregular coastline and the beauty of the sea, in the difficulty of building port facilities in case of high coasts or of low coasts with ponds and lagoons. In the North (provinces of Sassari and Olbia-Tempio) there are areas rich in ravines and rocky

[4] The criteria by which the four regional macro-groupings have been drawn are explained in the following paragraphs (Ugolini, G. M., 2013b).

Revista de Estudios Andaluces, vol. 34, núm. 1 (2017) pp.429-452. e-ISSN: 2340-2776
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points, known not only to boaters. This area includes the Costa Smeralda, the archipelago of La Maddalena, the strait of Bonifacio with Castelsardo to the West, the point of Stintino and Capo Caccia and the town of Bosa: over half of the Sardinian ports are located in this stretch of coast.

On the East coast, within the provinces of Nuoro and Ogliastra, the presence of ports becomes much more sparse and irregular coasts are replaced by stretches of high, calcareous and compact coast. Further South, wide beaches are also found (Rei coast). In the provinces of Cagliari and Carbonia-Iglesias the coast offers a number of places much appreciated for beach tourism (Villasimius) and then it becomes high again until it opens on the Gulf of Cagliari with the islands of Sant'Antico and Carloforte with a fair number of tourist port facilities. The last macro-area is the Western one within the provinces of Oristano and Medio Campidano: this area has very few infrastructures and is characterized by the Gulf of Oristano and by alternating low and sandy shores, lagoons and ponds and a few stretches of more compact coast.

To better understand the distribution of the supply within the region it is necessary to point out the profound unevenness of structures along the island's coastal development. Most of the facilities - 49 out of 80 (61%) - can be found in the Northern area, namely in the provinces of Olbia-Tempio and Sassari. In the Southern area of Carbonia-Iglesias and Cagliari there are 22 facilities, while the percentage in the other areas is residual (Table 2 and Figure 1).

Table 2. Breakdown of Sardinian port structures within the geographical groupings.

Geographical grouping	Marinas		Poly-functional ports		Moorings		Total	
	a.v.	%	a.v.	%	a.v.	%	a.v.	%
North	10	83.3	18	43.9	21	77.8	49	61.3
West	-	-	4	9.8	-	-	4	5.0
East	-	-	4	9.8	1	3.7	5	6.3
South	2	16.7	15	36.6	5	18.5	22	27.5
Sardinia	**12**	**100.0**	**41**	**100.0**	**27**	**100.0**	**80**	**100.0**

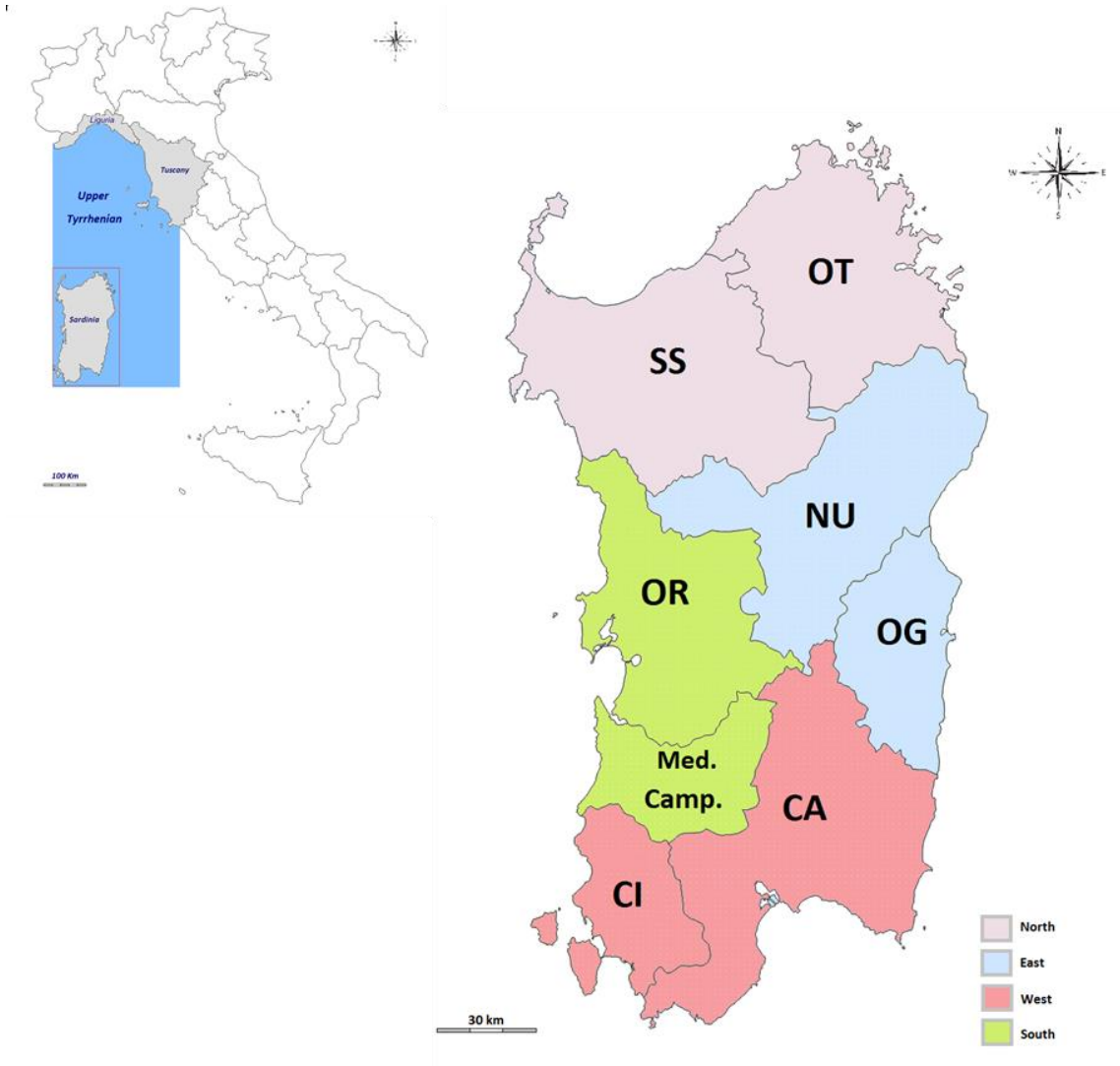
Source: Our elaboration from Osservatorio Nautico Nazionale (2013).

Shifting the focus on the quality of the structures present in the geographical groupings, we can see how the poly-functional ports are pre-eminent in all four groups. Indeed, in the most depleted areas of the West (provinces of Oristano and Medio Campidano, the latter being the only Italian province by the sea lacking even a single port structure) they are the only type of structure, while in the east (provinces of Ogliastra and Nuoro) as much as 80% of the structures are poly-functional ports.

Among the best equipped areas, only in the South the poly-functional ports constitute the largest percentage (68%), while in the North the majority consists of moorings, accounting for 42% of the structures. Finally, marinas in the whole island constitute an

average of 15% of the structures, resulting from the combined values of 20.4% in the North and 9.1% in the South.

Figure 1. The division by province and the four regional groupings.



Source: Our elaboration.

Even considering the analysis by type of ports within the geographical distribution, we note that the North represents more than 61% of the regional total, the South just over a quarter, while the remaining 11% is divided equally between the eastern and the western coasts. In qualitative terms, the relative majority is also found in the structures of the provinces of Olbia-Tempio and Sassari, with a large deviation in the

Revista de Estudios Andaluces, vol. 34, núm. 1 (2017) pp.429-452. e-ISSN: 2340-2776
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case of marinas and moorings (in both cases with values around 80%), and with lower values (44%) in the case of poly-functional ports.

The diversity of the offer of nautical tourism is of course evident in much the same way in the analysis of the distribution of berths. In North Sardinia the majority of berths, over 82%, is found within marinas and poly-functional ports; in the western provinces, namely Oristano and Medio Campidano, the totality of berths, 1,204, is available in poly-functional ports; in the East, Nuoro and Ogliastra, two-thirds of the berths are found in poly-functional ports and one-third in moorings, for a total of 1,480 berths. Finally, in the South, most berths (nearly 64%) are found in poly-functional ports, and the remaining are 23% in marinas and 13% in mooring points.

The same analysis carried from the geographical point of view shows a homogeneous framework to that of the structures analysed above: the North accounts for almost 60% of the regional total, the South for just over a quarter, while the remaining 13% is divided equally between the Eastern and Western coasts (Table 3). In qualitative terms, the relative majority is also found in the structures of the provinces of Olbia-Tempio and Sassari, with a large deviation in the case of marinas and mooring points, with values of 76% (marinas) and 65% (moorings), with lower values, but still over 50%, in the case of poly-functional ports.

Finally, with regard to the average size of the ports, the boating infrastructure for the region of Sardinia in terms of average number of berths presents itself as follows: 438 berths in the marinas, 278 berths in the poly-functional ports and 119 in mooring points. In terms of geographical groupings, the structures have similar size, ranging between 301 berths in the structures of the west coast to the 241 on the north coast. In terms of type, the larger marinas are located in the South (with an average of 625 berths), the poly-functional ports in the North (317) and the mooring points in the East (400). However, this last figure is to be evaluated in view of the total number of structures which, as seen above, is very low in the western and eastern coasts (Table 3).

In order to highlight the specific nature of our area without detaching it from the context of the specific activity of yachting, we introduced an original criterion for segmenting the national territory and sea. The division into, and naming of, macro-areas, more than a traditional geographical criterion, matches the division of the areas where navigation and pleasure boating activity in proximity of the coast are practised, that is, without considering more challenging activity in terms of cruising distances. Similarly, the macro-areas identified relate to a number of features that revolve around parameters such as the offer of port facilities (type and quality of ports), the areas of origin of the tourists and the existence of inter-area flows, presumable medium-short range navigation basins, socio-economic parameters related to the port tariffs and the offering of services, entertainment, cultural and tourist elements of the hinterland.

Revista de Estudios Andaluces, vol. 34, núm. 1 (2017) pp. 429-452. e-ISSN: 2340-2776
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Table 3. The distribution of berths (absolute and % value) and average number of berths in the Sardinian port facilities, by geographical groupings.

Port facilities / Geographical groupings		North	West	East	South	Sardinia
Tourist ports (Marinas)	**n. of berths**	4,000			1,250	**5,250**
	%	76.2	-	-	23.8	**100.0**
	Average n. of berths	400			625	**438**
Poly-functional ports	**n. of berths**	5,698	1,204	1,080	3,429	**11,411**
	%	49.9	10.6	9.5	30.0	**100.0**
	Average n. of berths	317	301	270	229	**278**
Moorings	**n. of berths**	2,104		400	707	**3,211**
	%	65.5	-	12.5	22.0	**100.0**
	Average n. of berths	100		400	141	**119**
Total	**n. of berths**	**11,802**	**1,204**	**1,480**	**5,386**	**19,872**
	%	**59.4**	**6.1**	**7.4**	**27.1**	**100.0**
	Average n. of berths	**241**	**301**	**296**	**245**	**248**

Source: Our elaboration from Osservatorio Nautico Nazionale (2013).

Following these considerations we identified four macro-areas: the Upper Tyrrhenian, which includes essentially Liguria, Tuscany and Sardinia; the Central Tyrrhenian: Campania and Lazio; the South: Abruzzo, Molise, Puglia, Basilicata, Calabria and Sicily; the Northern Adriatic: Friuli Venezia Giulia, Veneto, Emilia Romagna and Marche (Table 1).

With a detailed knowledge of the situation in Sardinia, it is possible to compare it to that of its boating basin (Upper Tyrrhenian) and of Italy. The 80 Sardinian structures constitute 44.4% of all structures in the macro-area of the Upper Tyrrhenian (180) and 14.4% of the national total (554). It may be noted that the regional model is consistent with the reference macro-area (Upper Tyrrhenian) and with the national one. Although the poly-functional port is the main type of structure, the average percentage differs from the national one, which is 63.9%, and settles to 51.3% for the island. The difference is not to be found in the marinas, since the values for all three areas analysed (Sardinia, Italy, and Upper Tyrrhenian) range between 14.1% nationally and 16.9% for the Upper Tyrrhenian. It is due, instead, to mooring points that constitute more than a third of the total supply in Sardinia (33.8), compared to 22% for both the macro-area and the national total (Table 4).

As for the berths, based on the latest data available for this analytical elaboration[5] there are more than 156,000 berths nationwide, of which nearly 42,000 in tourist ports

[5]It is the same source used previously, namely the data from the 2012 edition of Pagine Azzurre, while those reported for the construction of Tab. 1 refer to the year 2013. The increase in the number of berths from 156,000 to 160,000 does not affect substantially the quality of the proposed elaboration.

Revista de Estudios Andaluces, vol. 34, núm. 1 (2017) pp.429-452. e-ISSN: 2340-2776
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Table 4. Geographical distribution of ports (Sardinia, Upper Tyrrhenian, Italy).

Types of ports		**Sardinia**	**Upper Tyrrhenian**	*Italy*
Tourist ports (Marinas)	**a.v.**	12	30	*78*
	%	15.0	16.7	*14.1*
Poly-functional ports	**a.v.**	41	111	*354*
	%	51.3	61.7	*63.9*
Moorings	**a.v.**	27	39	*122*
	%	33.8	21.7	*22.0*
Total	**a.v.**	*80*	*180*	*554*
	%	*100.0*	*100.0*	*100.0*

Source: our elaboration from Osservatorio Nautico Nazionale (2013)

or marinas, 97,000 in poly-functional ports, and almost 18,000 in mooring points. The percentage distribution of berths in Sardinia is as follows: 26.4% in marinas, 57.4% in poly-functional ports and 16.2% in mooring points. Considering the macro-area of the Upper Tyrrhenian, which includes Sardinia, Liguria and Tuscany, the percentage weight of berths in marinas is very similar to the national average (26.7%), it is higher in poly-functional ports (Italy 61.9%) and lower in mooring points (Italy 11.4%).

When considering the situation of Sardinia instead, the percentage of berths located in mooring points is higher than both the national data and the Upper Tyrrhenian, reaching 16%; the percentage of berths in poly-functional ports is lower (57.6%), while the data for the marinas is quite similar to the national data and the area of the Upper Tyrrhenian (Table 5).

Table 5. Geographical distribution of the berths (Sardinia, Upper Tyrrhenian, Italy).

Berths		**Sardinia**	**Upper Tyrrhenian**	*Italy*
Tourist ports (Marinas)	**a.v.**	5,250	15,860	*41,776*
	%	26.4	26.6	*26.7*
Poly-functional ports	**a.v.**	11,473	38,765	*97,054*
	%	57.6	65.1	*62.0*
Moorings	**a.v.**	3,194	4,897	*17,776*
	%	16.0	8.2	*11.4*
Total	*a.v.*	*19,917*	*59,522*	*156,606*
	%	*100.0*	*100.0*	*100.0*

Source: our elaboration from Osservatorio Nautico Nazionale (2013).

Following a survey[6] conducted by the authors, which involved 52%[7] of the managing authorities of boating facilities across the country, it was possible to analyse more

[6] This investigation covered more than 51% of the Italian infrastructure in terms of berths. It was conducted by the authors as part of the scientific management of the National Nautical Observatory and and related statistical data analysis. It was realised thanks to the availability of the many proprietary databases, integrated with the results of an online instant survey made in CAWI mode. It also involved

Revista de Estudios Andaluces, vol. 34, núm. 1 (2017) pp. 429-452. e-ISSN: 2340-2776
http://dx.doi.org/10.12795/rea.2017.i34.15

accurately the characteristics of berths in Sardinia by distinguishing the so called permanent moorings (with multi-year contracts, annual or seasonal) from those used for the sole daily transit.

The share of permanent berths up to 10 meters in Sardinia is greater than the data for the macro-area and for Italy as a whole: over 59% for Sardinia, 56.4% for the Upper Tyrrhenian and 47.8% for Italy. Approximately one fifth of the region's berths is allocated to boats up to 12 meters, 15.8% to those between 12 and 18 meters, and 3.4% to those between 18 and 24 meters (Table 6).

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Table 6. Geographical distribution of berths (Sardinia, Upper Tyrrhenian, Italy) for permanent mooring and daily transit, by length.

Length berths		**Sardinia**	**Upper Tyrrhenian**	*Italy*
< 10 m	berths for permanent mooring	59.1%	56.4%	*47.8%*
	berths for daily transit	*38.1%*	*37.3%*	*32.7%*
10.01 to 12 m	berths for permanent mooring	20.6%	18.0%	*25.0%*
	berths for daily transit	*27.5%*	*25.2%*	*27.9%*
12.01 to 18 m	berths for permanent mooring	15.8%	19.2%	*20.8%*
	berths for daily transit	*17.6%*	*20.2%*	*24.5%*
18.01 to 24 m	berths for permanent mooring	3.4%	4.7%	*4.9%*
	berths for daily transit	*9.8%*	*10.2%*	*9.3%*
> 24.01 m	berths for permanent mooring	1.1%	1.8%	*1.5%*
	berths for daily transit	*7.0%*	*7.1%*	*5.6%*

Source: our elaboration from Osservatorio Nautico Nazionale (2013)

As for transit, the distribution of berths by length matches that of the macro-area of the Upper Tyrrhenian: 38.1% are allocated to crafts, 27.5% to boats up to 12 meters, 17.6% to those between 12 and 18 meters, 9.8% to boats between 18 to 24 meters and 7% intended for the transit of yachts (Table 6).

the re-processing of data obtained from previous surveys conducted by the National Nautical Observatory among boaters and managing authorities of the port structures of Sardinia.

[7] In terms of berths.

Revista de Estudios Andaluces, vol. 34, núm. 1 (2017) pp.429-452. e-ISSN: 2340-2776
http://dx.doi.org/10.12795/rea.2017.i34.15

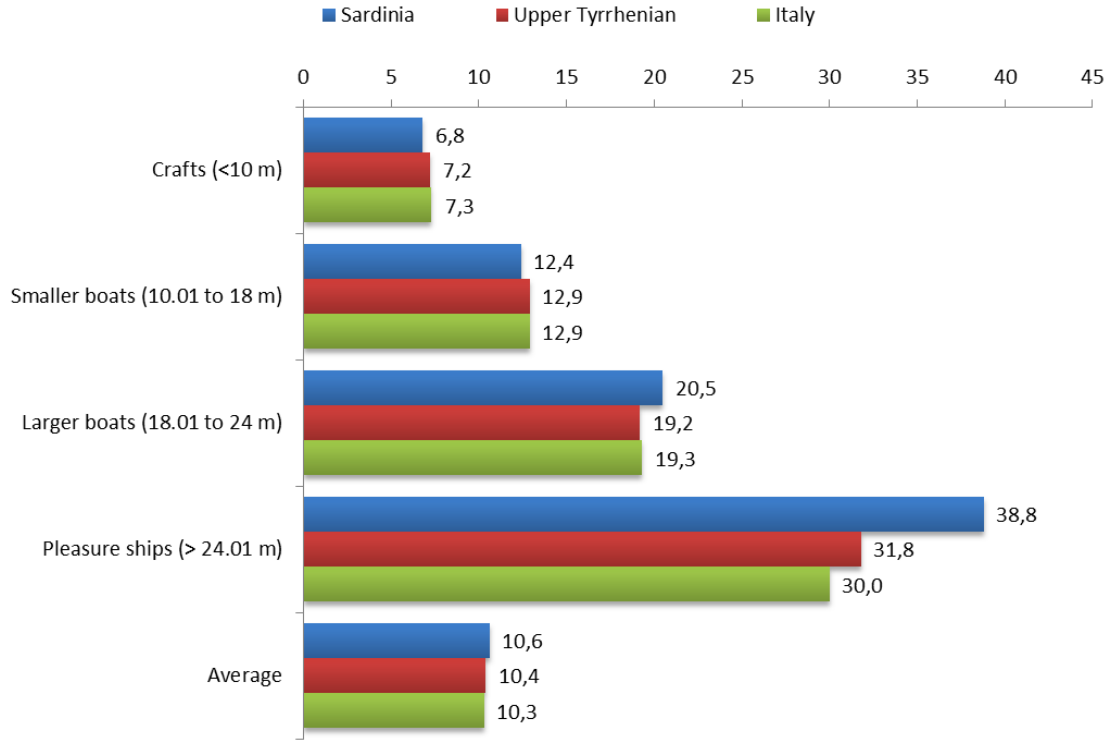
The distribution of permanent berths by type of structure is more significant: in particular, the share of berths for the permanent mooring of yachts is high at 1.1% compared to 7% of berths intended for boats in transit (Table 6).

4. DISCUSSION

Leaving aside here a description of the demographic and socio-economic characteristics of the pleasure boater, it is useful to focus on the comparison of the data that explicitly concern the boat used and the phase of navigation. Such data shows how port infrastructures influence or facilitate the practice of nautical tourism in addition to the attractiveness of coasts and waters (here we are not looking at the naturalistic, cultural, landscape characteristics of port hinterlands in terms of their attractiveness to boaters).

Therefore, it is interesting to start from the analysis of the size of recreational crafts. The class of crafts and boats up to 18 meters in Sardinia have a smaller average size than in both the whole country and the Upper Tyrrhenian. On the other hand, for boats between 18 and 24 meters, and in particular for recreational vessels, the average size detected in Sardinia is larger than in the other areas (Figure 2). This indicates that at the high levels the situation of Sardinia has a higher standard (average size).

Figure 2. Average length in meters of different types of boats.



Source: Our elaboration.

Revista de Estudios Andaluces, vol. 34, núm. 1 (2017) pp. 429-452. e-ISSN: 2340-2776
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A rather significant difference is revealed by segmenting the pleasure crafts based on propulsion and type: motor units, sailing or pneumatic units. In this analysis the percentage of pneumatic units is higher in Sardinia (12.2%) compared to the Upper Tyrrhenian (4.6%) and to the national average (3.9%). The smaller share of sailing units (29.3%) is also significant compared to 37.7% in the macro-area, and 38.8% at the national level (Figure 3).

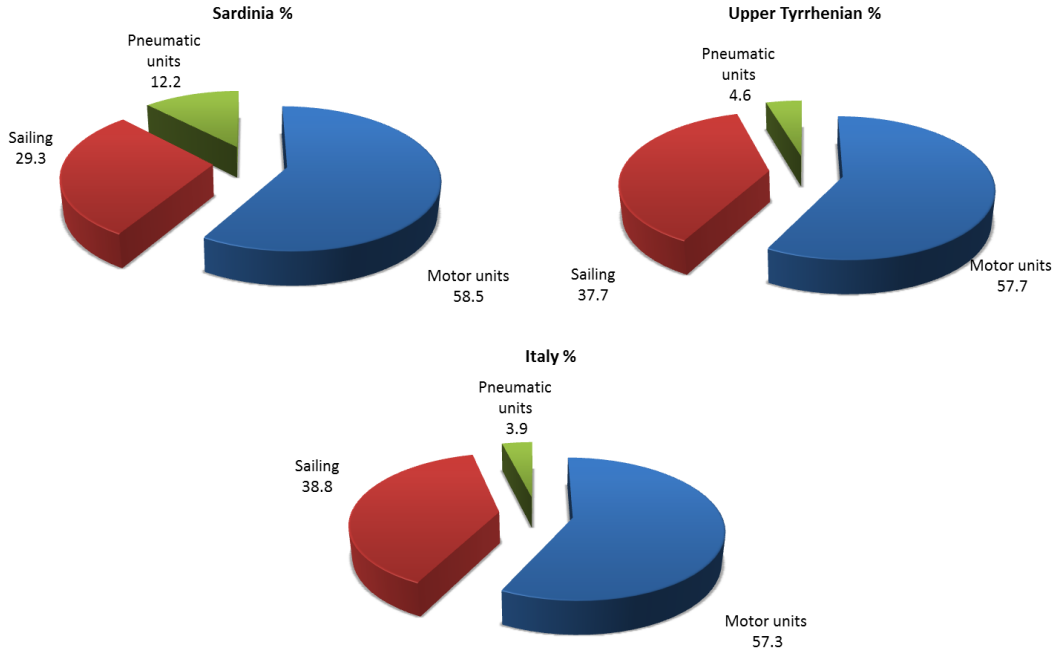
Units that gravitate around the Sardinian coasts are used on average more than in the other territories provided for comparative purposes: 39.2 days of use for vessels, 54.6 for boats under 18 meters, 54.8 for larger boats, and 38.3 for pleasure ships (Table 7). In contrast, the data for the macro-area and the whole country are significantly lower.

Table 7. Geographic distribution of days of use per year.

Type of boat	**Sardinia**	**Upper Tyrrhenian**	*Italy*
Crafts (<10 m)	39.2	34.8	*37.7*
Smaller boats (10.01 to 18 m)	54.6	37.3	*42.3*
Larger boats (18.01 to 24 m)	54.8	39.2	*42.8*
Pleasure ships (> 24.01 m)	38.3	31.4	*52.1*
Average	39.2	34.8	*37.7*

Source: Our elaboration.

Figure 3. Propulsion.



Source: Our elaboration.

Revista de Estudios Andaluces, vol. 34, núm. 1 (2017) pp.429-452. e-ISSN: 2340-2776
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When analysing the profile of those who sail along the coast of Sardinia, both those who keep their home port within the region and those in transit, it can be observed that the share of foreign boaters, almost 11%, is significantly higher than that recorded in the Upper Tyrrhenian (4.9%) and than the national average, 4% (Table 8).

Table 8. Percentage of use of the moorings (Italians and foreigners).

Macro Region/Region	Italians	Foreigners
Sardinia	89.2	10.8
Upper Tyrrhenian	95.1	4.9
Italy	*96.0*	*4.0*

Source: Our elaboration.

A more detailed observation, with a focus on the distribution of Italian and foreign resident boaters, shows that the percentage of foreigners in Sardinia is higher than in the macro-area and in Italy as a whole. In all three areas considered the demand from abroad is proportional to the figure for the length of the pleasure unit, but in the case of Sardinia this figure is considerably higher. It varies from a minimum of 8.3% of crafts (which falls to 1.7% at the national and macro-area levels), to a maximum of 25% for pleasure ships, which in the Upper Tyrrhenian are slightly over 14% and at the national level do not reach 7% (Table 9).

Table 9. Geographical distribution of resident boaters by origin.

Type of boat	**Sardinia**		**Upper Tyrrhenian**		*Italy*	
	Italians	Foreigners	Italians	*Foreigners*	*Italians*	*Foreigners*
Crafts	91.7%	8.3%	98.3%	1.7%	*98.3%*	*1.7%*
Smaller boats	88.0%	12.0%	96.9%	3.1%	*96.0%*	*4.0%*
Larger boats	79.0%	21.0%	85.7%	14.3%	*93.8%*	*6.3%*
Pleasure ships	75.0%	25.0%	85.7%	14.3%	*93.3%*	*6.7%*
Average	*89.6%*	*10.4%*	*97.1%*	*2.9%*	*97.3%*	*2.7%*

Source: Our elaboration.

As previously done for resident boaters, we examined the flow of boaters in transit. In this case the foreign component is more relevant and therefore we distinguished between EU and non-EU boaters. Again, the number of foreigners who gravitate around the Sardinian coasts is greater than in the other areas, and for all types of units, with the exception of crafts, the number of foreign boaters is higher than that of Italian boaters (Table 10).

Revista de Estudios Andaluces, vol. 34, núm. 1 (2017) pp. 429-452. e-ISSN: 2340-2776
http://dx.doi.org/10.12795/rea.2017.i34.15

Table 10. Geographical distribution of boaters in transit by origin.

	Sardinia			**Upper Tyrrhenian**			*Italy*		
	Italy	**EU**	**Non-EU**	**Italy**	**EU**	**Non-*EU***	*Italy*	*EU*	*Non-EU*
Crafts	80.0%	20.0%	-	90.0%	10.0%		*71.9%*	*21.1%*	*7.0%*
Smaller boats	36.3%	45.5%	18.2%	79.2%	16.7%	4.1%	*61.0%*	*32.5%*	*6.5%*
Larger boats	28.6%	49.7%	21.7%	70.0%	19.0%	11.0%	*52.0%*	*35.8%*	*12.2%*

Source: Our elaboration.

The average stay in the facilities of Sardinia is similar in the macro-area, while the national average of those who stop for one night is 10% lower (Figure 4).

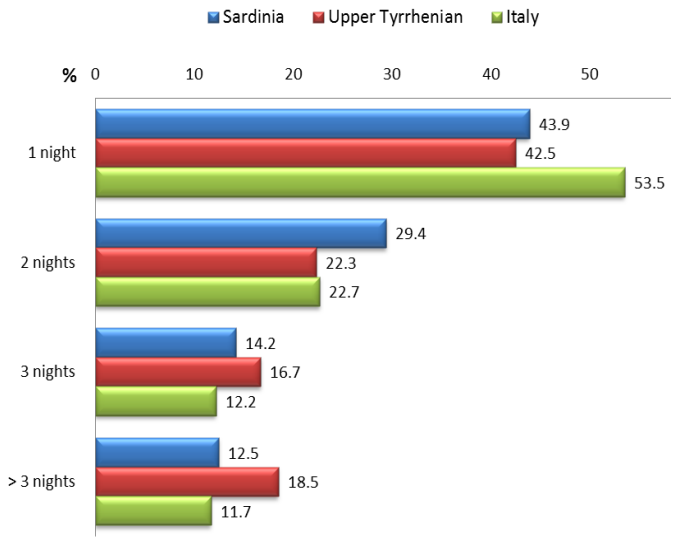
Summarizing the data of the above tables it is clear that on average the permanence of boaters in transit in Sardinia ranges from a maximum of 2.7 minor in mooring points to a minimum of 1.6 in poly-functional ports (Table 11).

Table 11. Geographical distribution of the average number of nights in transit.

Type of structure	Sardinia	Upper Tyrrhenian	*Italy*
Marinas	2.1	2.1	*1.9*
Poly-functional port	1.6	2.1	*1.9*
Moorings	2.7	2.3	*1.8*

Source: Our elaboration.

Figure 4: Geographical distribution of the average duration of the transit.



Source: Our elaboration

Revista de Estudios Andaluces, vol. 34, núm. 1 (2017) pp.429-452. e-ISSN: 2340-2776
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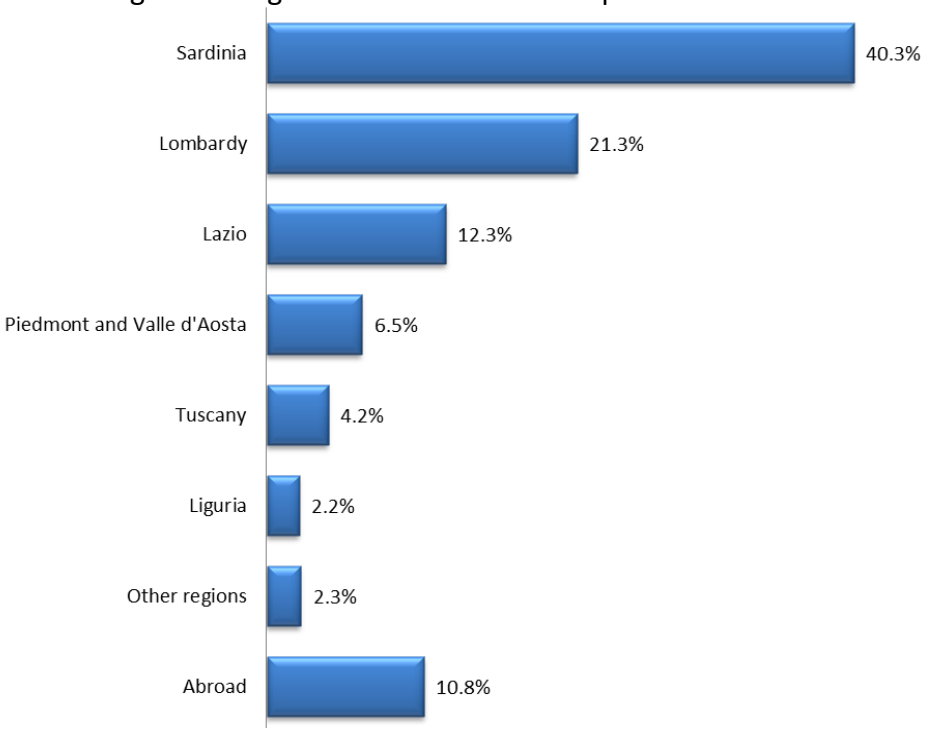
As for the country of origin, a survey was performed through the above-mentioned panel of pleasure boaters. The survey allowed to process the matrix of interregional flows through the elaboration of the place of origin (usually that of residence) and of the destination, namely the location hosting the home port, where the boat is moored. Crossing the data for all Italian regions we built a double-entry matrix that precisely quantifies interregional flows[8] (Figure 5). Starting from this process, for the first time in Italy, it was possible to obtain a reliable estimate of the origin of boaters that keep their boat in the island. Setting the total number of boaters to 100, their origins are as follows.

In view of the development of nautical tourism policies, the consequences of these insights are very relevant. On the one hand, the degree of openness to the outside, in particular as regards the aforementioned foreign component, is to be appreciated.

Figure 5: Origin of boaters with home port in Sardinia.



Source: Our elaboration.

On the other, the origin of boaters requires a careful and targeted activity of retention of boaters who choose Sardinia as their home port. In particular, it is important that Sardinians boaters, while remaining almost totally within the region (almost 97%), represent only 45% of the whole national component. Lombardy follows with nearly a quarter of all boaters and then Lazio with 13.8%. All the other relevant places of origin are part of the basin identified as Upper Tyrrhenian, namely, in descending order,

[8] For a complete description see Osservatorio Nautico Nazionale (2014).

Piedmont and Valle d'Aosta, Tuscany and Liguria. Other places of origin are totally residual, with the north-eastern regions as the most represented.

5. CONCLUSIONS

This analysis is a first step to identify the specific characteristics of nautical tourism in the islands. The case of Sardinia, the second island of the Mediterranean with over 1,800 km of coastline, can usefully be compared to that of other islands with similar characteristics (starting with Corsica) and help build a paradigm for the management and development of sustainable nautical tourism.

The Italian situation, within which Sardinia is to be located, presents a very broad and diffuse offer of ports at the regional level. The northern regions (in the Upper Tyrrhenian and in the North Adriatic Sea) are certainly those with the most structured marinas and with the best level of service. This can be deduced from the number of facilities and from their quality, using marinas as a proxy.

In this regard, we consider of particular interest the definition of "navigation basins" which identify stretches of water that constitute the privileged area of navigation for those coming from home ports located in the adjacent regions. This excludes the most demanding cruise activities that require a long time and both sail and motor boats of a larger size.

Sardinia occupies a pre-eminent position in its area, the basin of the Upper Tyrrhenian, and also at the national level: its main features are the presence of 80 ports of different types and of almost 20,000 berths. It also features a fair number of marinas, 12, with more than 5,200 berths, that is more than a quarter of the total.

The peculiar geographical distribution of port facilities looks rather unbalanced. The northern part is certainly the best equipped with 49 ports, including 10 marinas (61% of the total). There are several explanations for this: an irregular coastline, with coves and inlets that favour the presence of ports; the beauty of the coast and waters, that greatly attracts the boaters; the direct access to Liguria (and, through it, to all the rich north-west of Italy), to Tuscany and to the French Riviera. Only the South of the island can somehow compete (22 ports), while in the Western and Eastern coasts there are only 9 ports.

The strong position of the island as a whole and the even stronger one of the Northern part, is also evident in the basin of the Upper Tyrrhenian. The ports as a whole represent more than 44% of the total, the marinas make up 40%. The survey conducted among the managing bodies of Sardinian ports identified another specificity. Ports offer a high number of berths to crafts under 10 meters long, by

Revista de Estudios Andaluces, vol. 34, núm. 1 (2017) pp.429-452. e-ISSN: 2340-2776
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reason of a high incidence of pneumatic units, as will be seen later. At the opposite of the range of boats, there is a higher number of temporary berths reserved for yachts (over 24 meters), that constitute an important segment of pleasure boating in Sardinia.

Original data also emerge from the survey on Sardinian boaters, that is those who have their home port in Sardinia or have been on a cruise in Sardinian ports. One of the most significant piece of data regards the use of vessels that are smaller on average in the range of crafts up to 18 meters, while for larger boats the average size is greater than at the national level, especially as regarding yachts. This confirms a particular presence of the richest segment of boaters in Sardinian ports.

Finally, it should be stressed that nautical tourism in the island presents two additional peculiarities. It has a 10.8% share of foreign resident boaters (i.e. those keeping their boat in Sardinia), which is more than double the figure for the Upper Tyrrhenian and Italy. This supremacy shows in all the classes of boats, though it achieves excellence in the case of yachts (25%). A similar trend shows for the nationality of boaters in transit. Another characteristic element of the island is the origin of the Italian resident boaters. In fact, only 40.3% of the boaters are Sardinian residents, while the remaining 49% are from the continent.

In conclusion, nautical tourism in Sardinia has particular characteristics that have determined the location of the ports and their high level of quality. The demand is characterised by a significant share of foreign boaters, both resident and in transit, and by the presence of an above average number of large yachts, which are the richest segment of nautical tourism today.

This specificity does not mean that the port supply is already structured in the best way: further developments are certainly possible along the central and western coasts, where the distance between one port and the next exceeds 20-25 Miles and makes navigation unsafe in the event of ship damage or of weather conditions that require mooring in a port. Secondly, for existing structures the goal is to improve the compatibility of the port's presence and develop more sustainable systems of water management, waste disposal, lighting and electricity supply.

Above all, the ports must seek closer links with the surrounding area in terms of a real tourist offer that matches the needs of those who come from the sea and obviously have limited mobility on land. The real challenge to develop nautical tourism lies in organizing an offer in the form of real "tourist packages" that include timely information, promotion of natural, monumental, artistic, cultural treasures and of crafts, food and wine, and collective and individual transport. Such a challenge, paradoxically, is played more on solid ground than on the sea itself.

Revista de Estudios Andaluces, vol. 34, núm. 1 (2017) pp. 429-452. e-ISSN: 2340-2776
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